Mapping collective behavior–beware of looping

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Abstract: We discuss ambiguities of the two main dimensions of the map proposed by Bentley and colleagues that relate to the degree of self-reflection the observed agents have upon their behavior. This self-reflection is a variant of the ”looping effect” which denotes that, in social research, the product of investigation influences the object of investigation. We outline how this can be understood as a dimension of ”height” in the map of Bentley et al.

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Maps facilitate the orientation in complex worlds, and the target article by Bentley and colleagues provides an excellent map to the world of human decision behavior. But maps are more than descriptive tools, they coin entities and influence the way the map-makers think about the world – an information that feeds back to those who have been mapped. Ian Hacking established the term "looping effect" to outline that when humans (as opposed to, say, molecules) are the object of investigation, they consciously react to both the process and the product of investigation.

Famously, Hacking (1992) illustrated the principle of looping by pointing out the influence of medical-psychological classification systems on the prevalence of certain health-related conditions . For instance, in North America the condition labeled "multiple personality disorder" appeared to explode in frequency after the medical community accepted it as a disease, devoted scientific conference to the topic and had findings and opinions disseminate among the general public. In the UK, where the same condition was regarded a iatrogenic madness of the crowd, multiple personalities remained rare. Hacking's point was that illnesses can be transient and regional just like the classification manuals of mental diseases are bound to certain times and places. Mapping diseases is not principally different from mapping healthy human behavior, from sexual orientation to attitudes toward poverty, immigration and violence (Hacking, 1995), but also to first-name or Facebook popularity. Given the undeniable fact that, in social research, the product of investigation thus influences the object of investigation, in what ways could looping affect/shape/form the map proposed by Bentley and colleagues to describe human collective behavior? When people know that their behavior is in the Southeast (using Bentley's et al. terminology), what effect would this knowledge have? We suggest that this kind of information adds a third dimension to the map that may be captured by the analogy of height (or contour lines on geographical maps) indicating the degree of self-reflection the observed agents have upon their behavior. Even if you are in the same quadrant of the map – it is quite a different situation to be deep in a valley lacking "looping-related" insights compared to be on top of a hill indicating a high degree of self-reflection the agent (or system of agents) has with respect to their knowledge of what others know about them.

We suggest that such looping-related insights indicating the degree of self-reflection refer to two types of knowledge that are related to two ambiguities inherent to the dimensions of the map proposed by Bentley and colleagues. Their first dimension concerns the degree of social influence on the decision of the agent, with complete independence Far West and a pronounced susceptibility to mirror social expectancies Far East on their map. Going from West to East thus denotes an increase in social influence, which is associated with the ability to discern social behaviors and options associated with others' behaviors and to adopt the own behavior through mechanisms like, e.g., imitating. The perspective of looping, however, adds an additional knowledge component to this picture, because people make models (simple theories) on themselves as well as on other people with respect to the driving mechanisms of their behaviors. People may copy the behavior of others without knowing anything about why they display a particular behavior, or by having an accurate model of the mechanisms that drives the own and others' decisions. Although this does not directly change observed behavior patterns, it will have an impact, as outlined below.

The second dimension in the map of Bentley and colleagues captures the transparency in the payoffs and risks associated with the decisions agents make. In the Far North, people have full transparency

on what options are around and what their associated payoffs are. In the Deep South, options and their consequences are opaque. But again, we need to consider an orthogonal dimension associated with this North-South axis, one that takes looping into account. That is, it critically matters whether an agent is aware of whether his or her knowledge of option payoffs is accessible to third parties, too. People may have no transparency with respect to payoffs *and* know that others haven't this transparency either – or they may *not* know to what extend the others know the payoffs. Again, the opacity of the payoff for each person is the same, but the two situations drastically differ.

If we quantify effects of looping as the degree of self-reflection along the two dimensions as outlined above, we do not expect that the major characteristics of the behavioral pattern in terms of output change (e.g., Gaussian in the NW versus long-tailed in the SE) ENTWEDER FEHLT HIER NOCH EIN VERB ODER ICH VERSTEH'S NICHT GANZ… . However, we suggest that this additional dimension helps to understand the *dynamics of movements* (IST DAS NICHT PLEONASTISCH? REICHT NICHT "THE DYNAMLCS"?) on this map. In a nutshell, we believe that a higher degree of self-reflection will allow for quicker movements, i.e. make behavioral patterns more unstable. Having accurate knowledge (and models) of what drives others' decisions will allow for strategic decisions that then may change the behavioral mechanisms of others, just as the "invention"/"creation"of new diseases has shown, as they provided novel "identities" for persons (MAYBE ADD SOME MORE HERE, PERHAPS JUST) – i.e., a mechanism of de-stabilization. In contrast, not knowing that others don't know either enhances the opacity of payoffs and may contribute to pluralistic ignorance. This would stabilize social dynamics, if often only in a suboptimal way. Taken the map analogy as elaborated above: a higher degree of self-reflection means standing on a mountain with a (panoramic?) view, but risking falling down (and consequently be relocated on the map). Finally, this analogy points to an additional aspect when taking looping into account: Increased self-reflection –also through sociological research relying on behavioral maps – may not be positive in all cases. While many situations may require an increase in self-reflection, in other situations, supported, e.g., by privacy arguments) too much self-reflection may be unwanted/detrimental/counter-productive/may lend a disservice to the agent.

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